EXHIBIT A

Exhibit "A"

THURSDAY

Wk 33 • Day 230, 135 Left AUGUST 18, 1994

DIARY AND WORK RECORD

HRS | NAME OF PROJECT | DESCRIPTION | MI

8

9

10 00 Williamson Ptg.
Bill Davis
Jesse Williamson
Bob Emrick.

11

12 AB II within 4 weeks.
Remove SB Consent HD/ES.

1 Arrange meeting Bill/Bob/Heid*
Heid - Bob Berg*

2

3

4

5

WC13199

MONDAY

WR 35 • Day 241, 124 Left AUGUST 29, 1994

DIARY AND WORK RECORD

PS	NAME OR PROJECT	DESCRIPTION	TIME
8	Allcentre'	Rodger Heir	
9	ⓑ HV/ABII on everything		
	ⓒ as all others plus UV.		
10			
	Exhaust + BD of HR.		
1E			
2			
F			
2	.45. - Williamson		
	Bill Dennis.		
3	102+L+Y+LX *		
	triple towers		
4			
5			

MONDAY
SEPTEMBER 12, 1994
APPOINTMENTS & SCHEDULED EVENTS

TO BE DONE TODAY (ACTION LIST)

Hitachi
HiAce

EXPENSE & REIMBURSEMENT RECORD:

WEDNESDAY 31

Wk 40 • Day 278 87 Left OCTOBER 5, 1994

DIARY AND WORK RECORD

8

9

10 To Williamsburg.
Terry W. / Bill Davis
Bob Emmick / Bill Gonzales.

11

12

1

2

3

4

5

MONDAY
NOVEMBER 14, 1994
APPOINTMENTS & SCHEDULED EVENTS

HRS	NAME	PLACE	SUBJECT

TO BE DONE TODAY (ACTION LIST)

Calls - Krasfeld.
215 - 343 - 9300
1. Write to Brandenton.
2. Sched conference visit
Track/Williamson.
3. JV extension.

EXPENSE & REIMBURSEMENT RECORD:

DATE	AMOUNT	CATEGORY	DESCRIPTION	PAYMENT METHOD	APPROVED

Bill Davis

TUESDAY ~~[illegible] 4/92~~
NOVEMBER 15, 1994
APPOINTMENTS & SCHEDULED EVENTS

HOURS	NAME	PLACE	SUBJECT

Patterson Press
Head Spin Scene

28* - 35,000 max
& comps [illegible]
~~[illegible]~~

TO BE DONE TODAY (ACTION LIST)

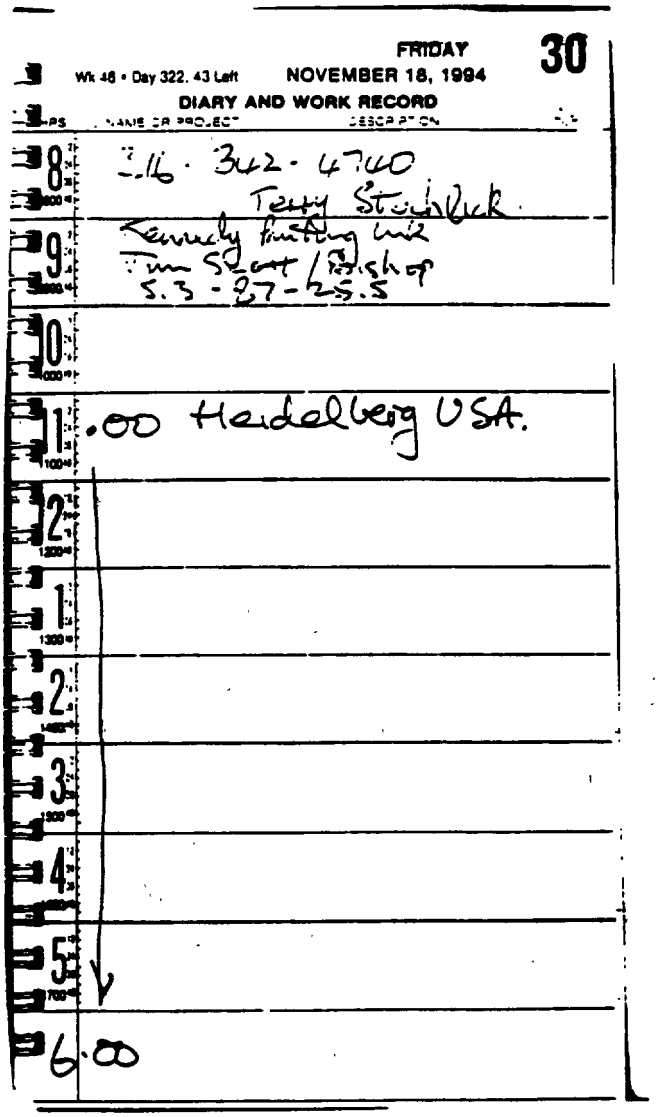
ANDERSON
KIRK
RICE.
Paisano

Pressure very critical
[illegible]
at 15000 - p. can
[illegible]

EXPENSE & REIMBURSEMENT RECORD:

Bill Davis, 214-904-2100
Ed /[illegible], [illegible]

W013204


FRIDAY
30
Wk 48 • Day 322. 43 Left
NOVEMBER 18, 1994
DIARY AND WORK RECORD
NAME OR PROJECT
DESCRIPTION
8
716 · 342 · 4700
Terry Stoinick
9
Kennedy printing unit
Tim Scott / Bishop
5.3 - 27 - 25.5
10
11
.00 Heidelberg USA.
12
1
2
3
4
5
6.00

MONDAY
NOVEMBER 21, 1994
APPOINTMENTS & SCHEDULED EVENTS

S	TIME	PLACE	SUBJECT

TO BE DONE TODAY (ACTION LIST)

Performance 819, 1000
Williamson P.C-90,2
3012 Fairmont

700 Package

EXPENSE & REIMBURSEMENT RECORD:

Date	Amount	Date	Amount

W013206

MONDAY **30**

Wk 47 • Day 325, 40 Left NOVEMBER 21, 1994

DIARY AND WORK RECORD

8 Jack Stoughton
Ray Hemmings

9

10

11

12 Bill Davis

1 Bill Davis / Jesse Williamson
Terry Britton Training.

2

3 Jay Pete Performance
6CT63 — S-V Clamps

4

5

7:11 E.D. JACK STOUGHTON
FLT #1469 DELTA.

W013207

TUESDAY 31

Wk 51 • Day 354, 11 Left DECEMBER 20, 1994

DIARY AND WORK RECORD

HRS	NAME OR PROJECT	DESCRIPTION	UP
8	WILLIAMSON PTG.		
9			
10			
11			
12			
1			
2			
3			
4			
5			

WEDNESDAY 31
Wk 51 • Day 355; 10 Left DECEMBER 21, 1994
DIARY AND WORK RECORD

8 WILLIAMSON PTG.
9
10
11
12
1
2
3
4
5

WEDNESDAY
Wk 1 • Day 4 • 361 Left JANUARY 4, 1995 3
DIARY AND WORK RECORD
HRS NAME OR PROJECT DESCRIPTION

8
9
10
11
12
1 30 Agl Wayne Fox Mike Curtis.
2 Metallic/Fluorescent.
Hartman Stanley, Toronto
Dave Defren
416-638-1622
3
4 Metallic.
5

THURSDAY 31

Wk 2 • Day 12 353 Left JANUARY 12, 1995

DIARY AND WORK RECORD

NAME OF PROJECT DESCRIPTION TIME

8 Kansas City.

9 Burd & Fletcher X 21st Workshop

10 Midland Litho. Cancelled.

11

12

1

2 St Louis Litho.

3 314-352-1300

Ross Kluge

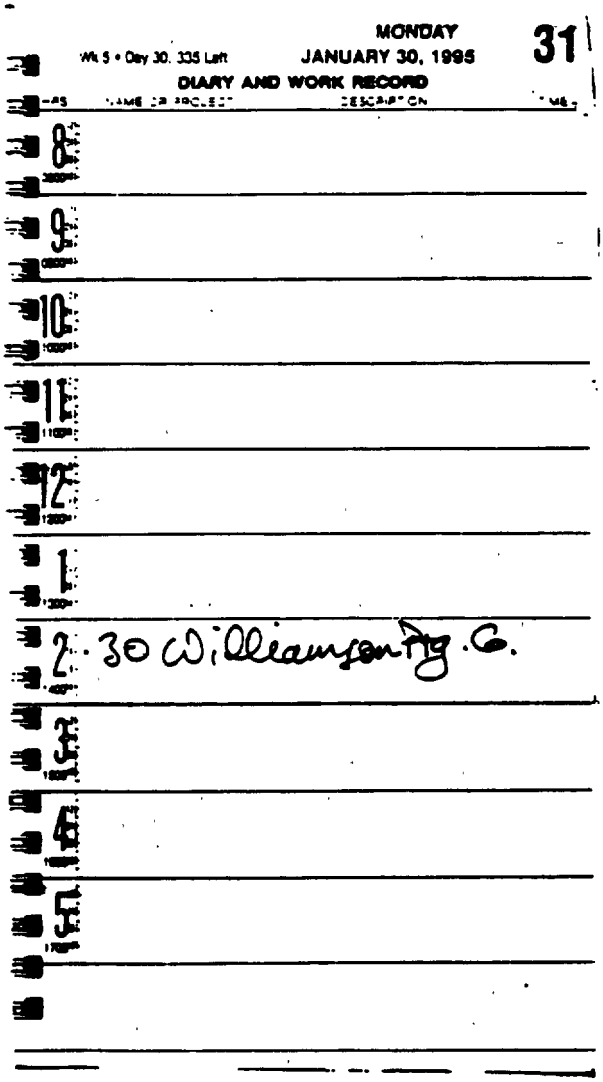
Joe Stein

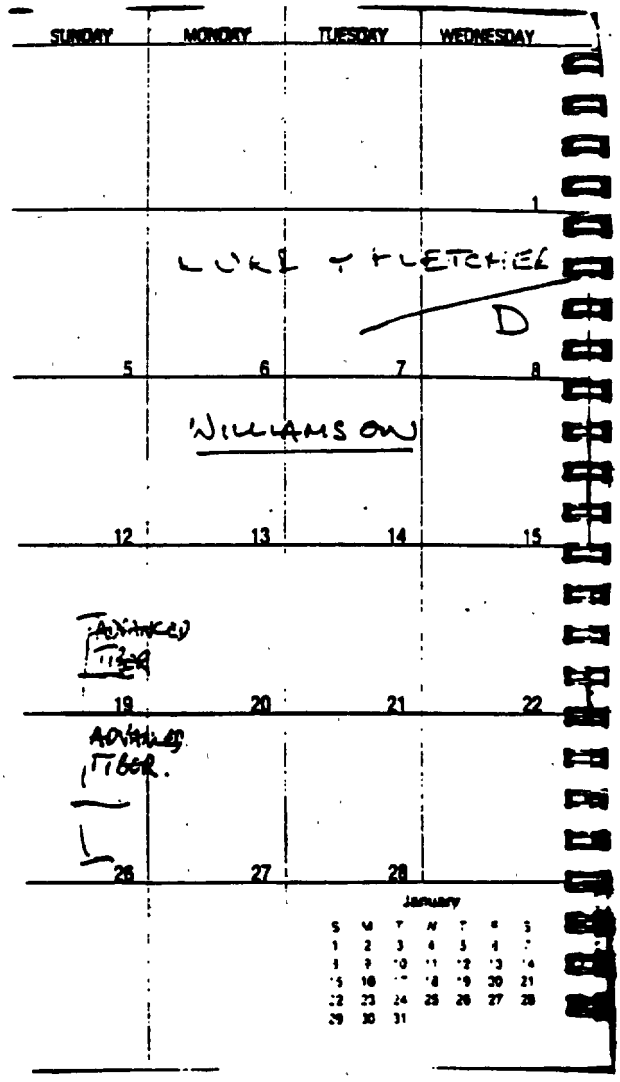
4 Very interested w/to match at least 90% of Lorenz

5

Chicago.

9:00 CoCC Frank 301-942-8572





DIARY AND WORK RECORD

HRS	NAME OR PROJECT / DESCRIPTION
8	Call Bill Davis / Williamson
0800	Bob Sweet quote 2 lamp
9	and 4 over 4 cold UV
0900	26"/26"
10	
11	
12	
1	
2	
3	
4	
5	

Wk 6 • Day 42, 323 Left

SATURDAY
FEBRUARY 11, 1995

28

DIARY AND WORK RECORD

HRS	NAME OR PROJECT / DESCRIPTION
8	
9	.00 – HD/Williamson.
10	
11	
12	
1	
2	
3	
4	
5	
	30 miles

W013215

WEDNESDAY
FEBRUARY 15, 1995
28

Wk 7 • Day 46, 319 Left

DIARY AND WORK RECORD

HRS	NAME OR PROJECT	DESCRIPTION
8	Vent-A-Hood ~~order~~	
	Touch pad - from LYC	
9	Schedule LYC.	
	MD ~~Bath~~ samples	
10	Wolstenholme visiting April 11	
	awards.	
11	:30 Bill Davis	
12		
1		
2		
3		
4		
5		

FRIDAY
FEBRUARY 24, 1995
APPOINTMENTS & SCHEDULED EVENTS

HRS	NAME	PLACE	SUBJECT

Silver Wolfstenholme
How much?
Gold

TO BE DONE TODAY (ACTION LIST)

EXPENSE & REIMBURSEMENT RECORD:

Item (What)	Where / Duration	Purpose/Who was involved	To whom paid	Reimbursed (By whom)	Amount

W013217

Wk 8 • Day 55, 310 Left

FRIDAY
FEBRUARY 24, 1995

28

DIARY AND WORK RECORD

HRS	NAME OR PROJECT / DESCRIPTION
8	
9	Williamson Ptg.
10	Bob Emrick / Bill Davis Jesse Williamson
11	Drying on impression after 45 min Nothing showing on densitometer ~~Wet Trap / Dry Trap / UV Trap~~
12	Varnish definite advantage. Mechanical shutter for edge.
1	7 color every unit. UV on LYC only.
2	
3	
4	
5	

WEDNESDAY
MARCH 1, 1995
31

Mt 3 • Day 60 305 Left

DIARY AND WORK RECORD

HRS	NAME OR PROJECT	DESCRIPTION	THIS
8			
9	Advanced Litho. Wilcus Demetz		
10	Needs to look at E2 metallic application a sap.		
11	He continues to want to work with E2.		
12	Excimer got great picture.		
1	Terry Meyers. - GAC.		
2			
3	Ron Sorg - Sokos. Heidelberg Eqpt.		
4	Heid. 74 is of strong interest over next 12 months.		
5			

TUESDAY
MARCH 7, 1995

APPOINTMENTS & SCHEDULED EVENTS

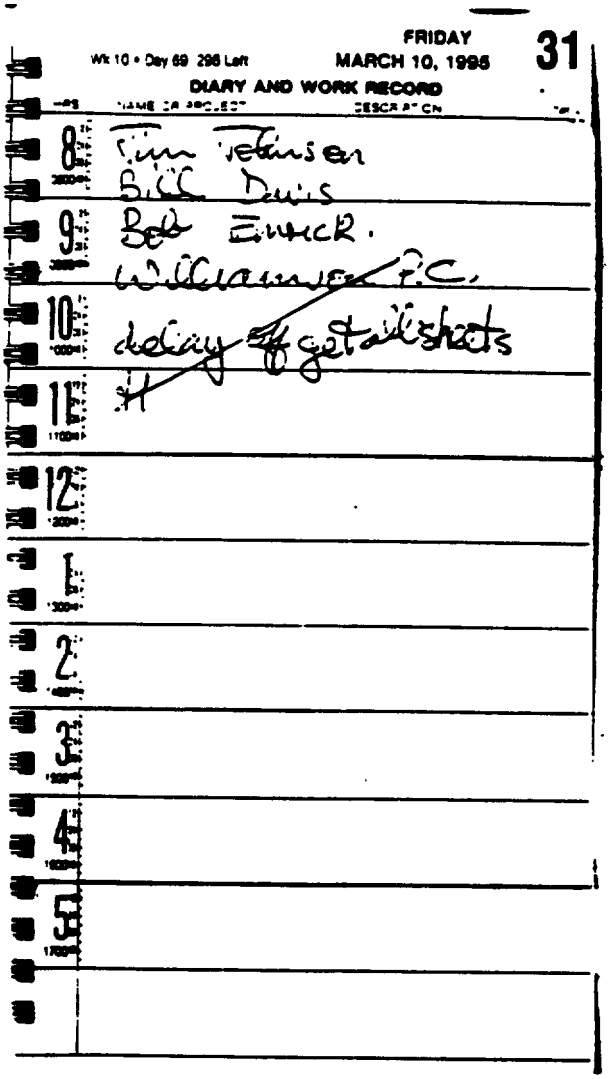
WHO	WHEN	WHERE	SUBJECT
Bill Davis			
① Venta - food control on delivery?			
② " " complete Wednesday.			
" " "			

TO BE DONE TODAY (ACTION LIST)

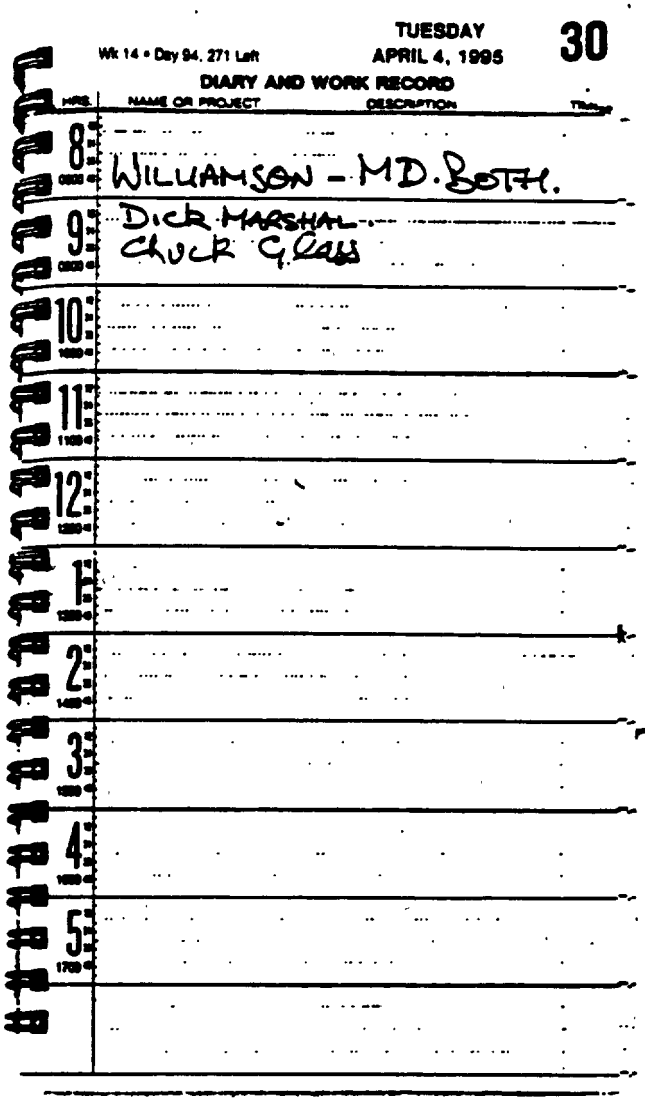
D I Chargé.

EXPENSE & REIMBURSEMENT RECORD:

WHO	AMOUNT	FOR WHAT	PAID BY	REIMBURSED



TUESDAY 30
Wk 14 • Day 94, 271 Left APRIL 4, 1995
DIARY AND WORK RECORD



THURSDAY

APRIL 6, 1995

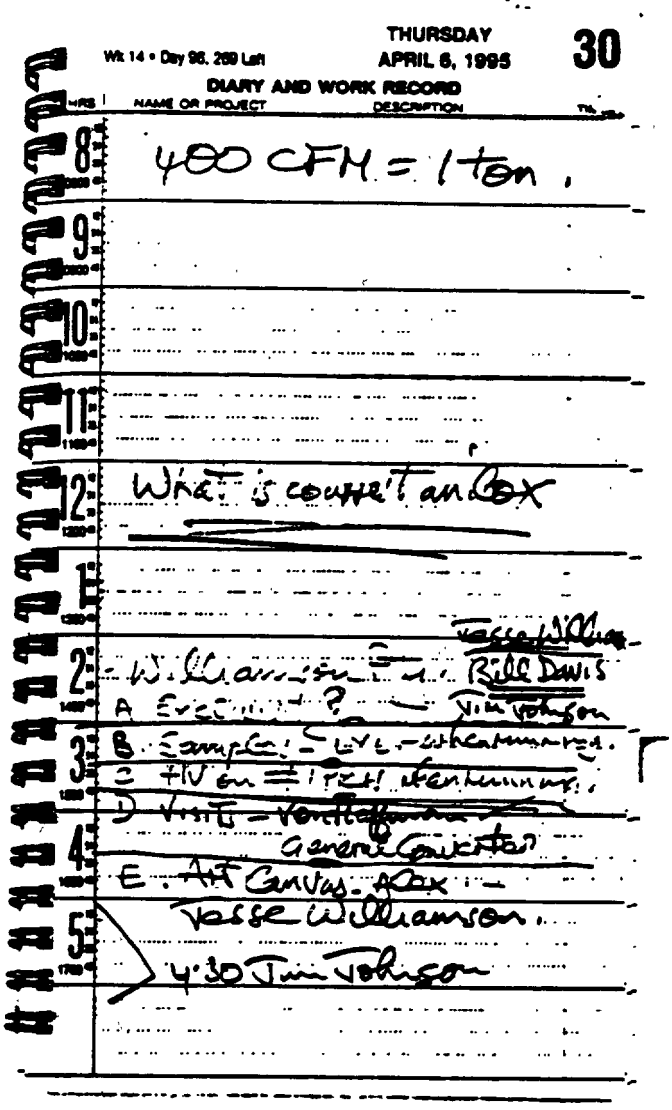
APPOINTMENTS & SCHEDULED EVENTS

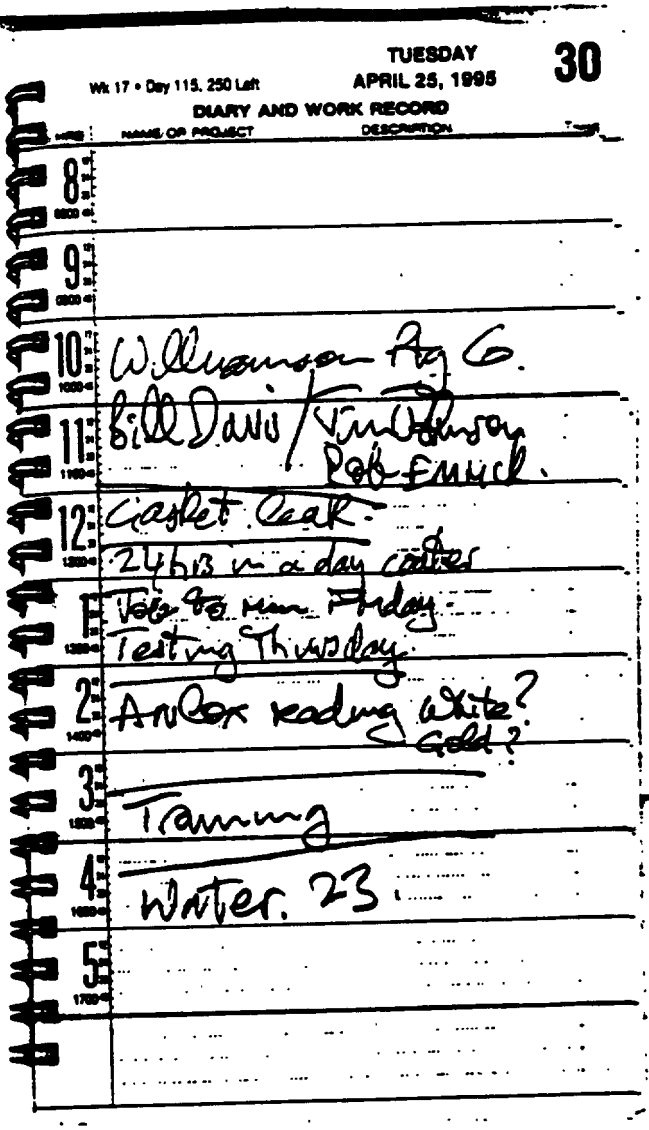
HRS.	NAME	PLACE	SUBJECT

TO BE DONE TODAY (ACTION LIST)

1. Marking – Coating tower when not coating.
2. Exclusivity: 6 months; USA – 12 months – [illegible]?

EXPENSE & REIMBURSEMENT RECORD:




TUESDAY
APRIL 25, 1995
30
Wk 17 • Day 115, 250 Left
DIARY AND WORK RECORD
NAME OF PROJECT
DESCRIPTION
8
9
10
11
12
1
2
3
4
5
W. Williamson Ag G.
Bill Davis / Tim Johnson
Rob Enoch.
Gasket leak.
24hrs in a day cattle
Vet's to run Friday
Testing Thursday
Anchor reading White?
Gold?
Training
Winter. 23.

TUESDAY
MAY 2, 1995
APPOINTMENTS & SCHEDULED EVENTS

HRS	NAME	PLACE	SUBJECT

TO BE DONE TODAY (ACTION LIST)

1. ~~[illegible]~~.
2. ~~Great Western~~
3. ~~Graphic Arts [illegible]~~ /GATF
4. Gloss Back.
5. HV [illegible]
6. ~~[illegible] gold - Bill~~
6. ~~Exclusivity~~ -
7. ~~TimeLine EZ's~~ -
8. Posters/PostCards

EXPENSE & REIMBURSEMENT RECORD:

Pulled job, fit and problem.
decision [illegible] -
[illegible]

W013226

TUESDAY
MAY 2, 1995
30

Wk 18 • Day 122, 243 Left

DIARY AND WORK RECORD

HRS.	NAME OR PROJECT / DESCRIPTION	TIME
8	Label Carter	
9	Greeting. 1st Period N. America	
10	+ AZ, CO. 1st Installation 90 days	
11	to install 1 and 2 yrs.	
12		
1	.30 Jesse Williamson. Bill Davis.	
2	3:00 ~~Arlex take back~~	
3	~~Leafing silver Oven~~ to WPC.	
4	UV lamps moved down.	
5	~~PO # 331.5~~ 1st down ~~center~~ EZ.	
	~~UV for 8 color~~	

(#25)

W013227

EXHIBIT B

Exhibit "B"

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 741 025 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
28.05.1997 Bulletin 1997/22

(51) Int. Cl.[6]: B41F 31/30, B41F 5/24, B41F 23/08

(43) Date of publication A2:
06.11.1996 Bulletin 1996/45

(21) Application number: 96302736.4

(22) Date of filing: 03.05.1996

(84) Designated Contracting States:
DE FR GB IT SE

(30) Priority: 04.05.1995 US 435798

(71) Applicant: DeMoore, Howard W.
Dallas, Texas 75220 (US)

(72) Inventors:
- DeMoore, Howard W.
Dallas, Texas 75220 (US)
- Randleman, Ronald M.
Dallas, Texas 75229 (US)
- Bird, John W.
Carrollton, Texas 75007 (US)

(74) Representative: Gura, Henry Alan et al
NEWBURN ELLIS
York House
23 Kingsway
London WC2B 6HP (GB)

(54) Retractable inking/coating apparatus having ferris movement between printing units

(57) A retractable in-line inking/coating apparatus (10) selectively applies either spot or overall ink/coating material to a blanket (B) or flexographic plate (P) on a blanket cylinder (34), or spot or overall ink/coating to a flexographic printing plate (P) on a plate cylinder (32) in a rotary offset printing press (12). The inking/coating apparatus is pivotally mounted on a printing unit (22, 24, 26, 28) or dedicated coating unit, and is extendable into and retractable out of an operative inking/coating position by a carriage assembly (58) which is pivotally coupled to the printing unit. Because of the pivotal support provided by a cantilevered support arm (88, 90), the inking/coating apparatus is extended and retracted through a Ferris wheel arc between adjacent printing units.

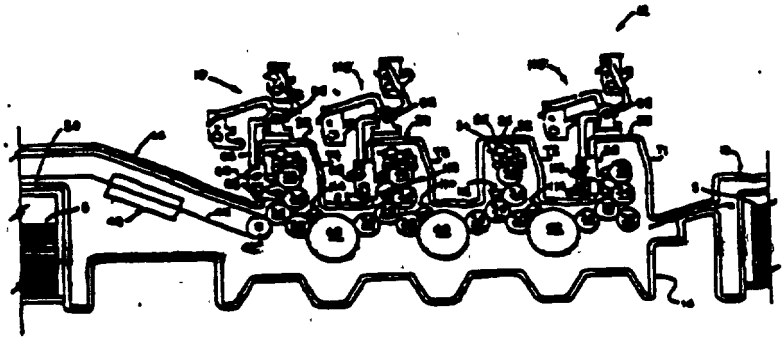


FIG. 1

EP 0 741 025 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 30 3136

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	US 4 841 903 A (BIRD) * abstract; claims; figure 1 *	1,15-17 4-6,8,9, 13	B41F31/30 B41F5/24 B41F23/00
X	US 5 187 790 A (SLIKER ET AL.) * abstract; claim 1; figures * * column 2, line 9 - line 22 *	1,18	
Y	US 5 335 596 A (DEMOORE ET AL.) * abstract; figures 1-4 * * column 7, line 32 - line 58 *	4,5,8,9	
Y	US 4 617 869 A (SWITALL) * abstract; figures 1-3 * * column 6, line 9 - line 42 *	6	
Y	US 4 825 804 A (DIRICO ET AL.) * abstract; figures 2,3 * * column 3, line 18 - line 21 *	13	
A	EP 0 647 524 A (DEMOORE) * abstract; figures 1,2,5 * * column 4, line 32 - line 48 *	15-22	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B41F
A	PAPIER + KUNSTSTOFF VERARBEITER, vol. 26, no. 6, 1 June 1991, page 129 XP000232825 'LACKIER-AGGREGAT FUER SPEEDMASTER-MASCHINEN'	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 March 1997	Helpiö, T

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same category
A: technological background
O: non-written disclosure
P: intermediate document

T: theory or principle underlying the invention
E: earlier patent document, but published on, or after the filing date
D: document cited in the application
L: document cited for other reasons

&: member of the same patent family, corresponding document

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 741 025 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
06.11.1996 Bulletin 1996/45

(51) Int. Cl.[6]: B41F 31/30, B41F 5/24

(21) Application number: 96303136.4

(22) Date of filing: 03.05.1996

(84) Designated Contracting States:
DE FR GB IT SE

(30) Priority: 04.05.1995 US 435798

(71) Applicant: DeMoore, Howard W.
Dallas, Texas 75220 (US)

(72) Inventors:
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- Rendleman, Ronald M.
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(54) Retractable inking/coating apparatus having ferris movement between printing units

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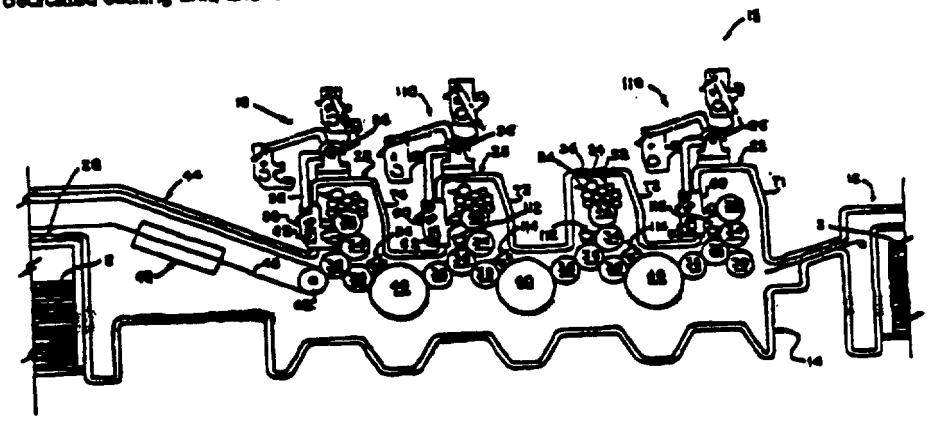

FIG. 1

EP 0 741 025 A2

Description

This invention relates to sheet-fed or web-fed. rotary offset or flexographic printing presses, and more particularly, to a new and improved inking/coating apparatus for the in-line application of printing inks or protective or decorative coatings to sheet or web substrates.

Conventional sheet-fed, rotary offset printing presses typically include one or more printing units through which individual sheets are fed and printed with wet ink. Since the inks used with rotary offset printing presses typically remain wet and tacky for some time after printing, special precautions must be taken to insure that the freshly printed sheets are not marked or smeared as the sheets are transferred from one printing unit to another, and while being conveyed to the sheet delivery stacker. The printed surface of the freshly printed sheet dries relatively slowly and can be smeared during subsequent transfer between printing units. In order to reduce smearing and offsetting, spray powder is applied on the printed sheet.

In some printing applications, offset and smearing are prevented by applying a protective and/or decorative coating over all or a portion of the freshly printed sheets. Various arrangements have been proposed for applying the protective or decorative coating as an in-line operation by using the last printing unit of the press as the coating application unit. However, when such in-line coating is performed, the last printing unit cannot be used to apply ink to the sheets, and can only be used for the coating operation. Thus, while coating with these types of in-line coating apparatus, the press loses the capability of printing its full range of colors since the last printing unit is converted to a coating unit.

It will be appreciated that the time required to reconfigure a press for coating or non-coating is non-productive and costly. Accordingly, there is a need for an in-line coating apparatus that minimizes the time to clean-up from one printing run and set-up and run the next job. Where consecutive jobs require the same type of coating, particularly blanket coating, it may not be necessary to clean-up the coater between jobs. However, the coating material cannot be allowed to dry on the rollers. Therefore, especially when switching from blanket to spot coating or vice versa, or if there is a delay between jobs, it is necessary to wash-up the coater after each job is completed.

In addition, coater wash-up is necessary when switching between different coating compositions, such as aqueous and ultra violet (UV) curable coatings. Such coating materials are not interchangeable, and consequently, the coater must be washed between applications of different coating media.

The foregoing limitations are overcome, according to the present invention, by a retractable, in-line inking/coating apparatus which is mounted on a printing unit for pivotal, Ferris wheel movement between an operative inking/coating position and a retracted, overhead idle position. The inking/coating apparatus includes an applicator head which, is positioned in alignment with either the plate cylinder or the blanket cylinder by a carriage assembly which includes a cantilevered support arm. The support arm is pivotally coupled between the inking/coating head and the printing unit tower. This cantilevered, pivotal mounting arrangement allows the inking/coating unit to be used between two printing units, as well as on the last printing unit of the press.

In the preferred embodiment, the applicator head includes vertically spaced pairs of cradle members with one cradle pair being adapted for supporting a metal or ceramic coating roller in alignment with a blanket cylinder, and the other cradle pair supporting a resilient anilox coating roller in alignment with the plate cylinder, respectively, when the carriage assembly is in the operative position. Because of the cantilevered, pivotal support provided by the support arm, the applicator head can be lifted and lowered through an arc, similar to Ferris wheel movement, in the limited space between adjacent printing units. When fully retracted, the applicator head and carriage assembly are lifted to an elevated, retracted overhead position, preferably an overhead position overlying the printing unit tower, thus providing complete access to the interstation space and the printing unit cylinders without causing the printing unit to lose its printing capability. The inking/coating applicator roller of the applicator head can be inspected, cleaned or replaced and the doctor blade assembly can be washed-up automatically while the inking/coating apparatus is in the retracted position.

When the inking/coating apparatus is used in combination with a flexographic printing plate and aqueous ink or aqueous coating, the water component of the aqueous ink or coating on the freshly printed sheet is evaporated by a high velocity, hot air interstation dryer and a high volume heat and moisture extractor assembly so that the freshly printed ink or coating is completely dry before the sheet is printed on the next printing unit. This quick drying flexographic printing/coating arrangement permits a base coat of ink, for example opaque white or metallic ink (gold, silver or other metallics) to be applied in the first printing unit, and then overprinted by a lithographic process on the next printing unit.

Exemplary embodiments of the present invention are illustrated in the drawing figures wherein:

FIGURE 1 is a schematic side elevational view of a sheet-fed, rotary offset printing press having inking/coating apparatus embodying the present invention;

FIGURE 2 is a perspective view of the printing press of FIGURE 1 in which a dual head inking/coating apparatus is in the operative coating position and a single head coater is in a retracted, overhead position;

FIGURE 3 is an enlarged, simplified perspective view showing one side of the single head ink-

ing/coating apparatus of FIGURE 1 in the operative position;

FIGURE 4 is a simplified side elevational view showing the dual head inking/coating apparatus in the operative coating position for spot or overall coating from the blanket position;

FIGURE 5 is a simplified side elevational view showing the single head inking/coating apparatus in the operative coating position for spot or overall coating from the plate position; and,

FIGURE 6 is a simplified side elevational view of the dual head inking/coating apparatus of FIGURE 4, partially broken away, which illustrates the hydraulic drive assembly and doctor blade assembly.

As used herein, the term "processed" refers to various printing methods which may be applied to either side of a substrate, including the application of UV-curable and aqueous inks and/or coatings. The term "substrate" refers to sheet or web material. Also, as used herein, the term "waterless printing plate" refers to a printing plate having non-image surface areas which are hydrophobic and also having image surface areas which are hydrophilic, wherein the non-image surface areas are characterized by a surface tension value which is less than the surface tension of aqueous ink, and the image surface areas are characterized by a surface tension value which is greater than the surface tension of aqueous ink. "Flexographic" refers to flexible printing plates having a relief surface which is wettable by aqueous ink or aqueous coating material.

As shown in the exemplary drawings, the present invention is embodied in a new and improved in-line inking/coating apparatus 10, for applying inks or protective and/or decorative coatings to sheets or webs printed in a sheet-fed or web-fed, rotary offset or flexographic printing press, herein generally designated 12. In this instance, as shown in FIGURE 1, the inking/coating apparatus 10 is installed in a four color printing press 12, such as that manufactured by Heidelberger Druckmaschinen AG of the Federal Republic of Germany under its designation Heidelberg Speedmaster 102V. The press 12 includes a press frame 14 coupled at one end, herein the right end, to a sheet feeder 16 from which sheets, herein designated S, are individually and serially fed into the press, and at the opposite end, with a sheet delivery stacker 20 in which the freshly printed sheets are collected and stacked. Interposed between the sheet feeder 16 and the sheet delivery stacker 20 are four substantially identical rotary offset printing units 22, 24, 26 and 28 which can print different color inks onto the sheets as they are transferred through the press 12. The printing units are housed within printing towers T1, T2, T3 and T4 formed by side frame members 14, 15.

As illustrated, the printing units 22, 24, 26 and 28 are substantially identical and of conventional design. The first printing unit 22 includes an in-feed transfer cylinder 30, a plate cylinder 32, a blanker cylinder 34 and an impression cylinder 36, all supported for rotation in parallel alignment between the press side frames 14, 15. Each of the first three printing units 22, 24 and 26 have an interunit transfer cylinder 38 disposed to transfer the freshly printed sheets from the adjacent impression cylinder to the next printing unit via an interstation transfer cylinder 40. The last printing unit 28 is shown equipped with a delivery cylinder 42 which guides each freshly printed sheet 18 as it is transferred from the last impression cylinder 36 to a delivery conveyor system, generally designated 44, to the sheet delivery stacker 20.

The delivery conveyor system 44 as shown in FIGURE 2 is of conventional design and includes a pair of continuous delivery gripper chains 46, only one of which is shown carrying at regular spaced locations along the chains, laterally disposed gripper bars having gripper fingers for gripping the leading edge of a freshly printed sheet 18 after it leaves the nip between the delivery cylinder 42 and impression cylinder 36 of the last printing unit 28. As the leading edge is gripped by the grippers, the delivery chains 46 pull the freshly printed sheet away from the impression cylinder 36 and deliver the freshly printed sheet to the sheet delivery stacker 20.

Prior to reaching the delivery sheet stacker, the freshly printed and/or coated sheets S pass under a delivery dryer 48 which includes a combination of infrared thermal radiation, high velocity hot air flow and heat and moisture extraction for drying the ink and/or the protective/decorative coating on the freshly printed sheets.

In the exemplary embodiment shown in FIGURE 1, the first printing unit 22 is equipped with a flexographic printing plate, and does not require an inking roller train or a dampening system. If an ink roller train is mounted on the first printing unit, the form rollers are retracted and locked off when the printing unit goes on impression. Flexographic aqueous ink is supplied by the inking/coating unit 110. The remaining printing units 24, 26 and 28 are equipped for lithographic printing and include an inking apparatus 50 having an inking roller train 52 arranged to transfer ink from an ink fountain 54 to the plate cylinder 32. This is accomplished with the aid of a fountain roller 56 and a ductor roller. The fountain roller 56 projects into the ink fountain 54, whereupon its surface is wetted with printing ink Q. The printing ink Q is transferred intermittently to the inking roller train 52 by the ductor roller. The inking roller train 52 supplies printing ink Q to the image area of a printing plate P mounted on the plate cylinder 32.

The printing ink Q is transferred from the printing plate P to an ink receptive blanket B which is mounted on the blanket cylinder 34. The inked image carried on the blanket B is transferred to a sheet S as the sheet is transferred through the nip between the impression cylinder 36 and the blanket B.

The inking roller arrangement 52 illustrated in FIGURE 1 is exemplary for use in combination with lithographic ink printing plates. It will be understood that

dampening rollers (not illustrated) will be in direct engagement with the lithographic plate P, but are not used in combination with the flexographic plate of printing unit 22.

Referring now to FIGURE 4, FIGURE 5 and FIGURE 6, the in-line inking/coating apparatus 10 includes a carriage assembly 58 which supports an applicator head 60. The applicator head 60 includes a hydraulic motor 62, a lower gear train 64, an upper gear train 65, an applicator roller 66 and a doctor blade assembly 68. The external peripheral surface of the applicator roller 66 is inserted into wetting contact with liquid coating material or ink contained in a reservoir 70. The reservoir 70 is continuously supplied with ink or coating which is circulated through the reservoir 70 from an off-press source by a pump (not illustrated). The hydraulic motor 62 drives the applicator roller 66 synchronously with the plate cylinder 32 and the blanket cylinder 34 in response to an RPM control signal from the press drive (not illustrated) and a feedback signal developed by a tachometer 72. While a hydraulic drive motor is preferred, an electric drive motor can be used.

The applicator roller 66 is preferably a fluid metering anilox roller which transfers measured amounts of printing ink or coating material onto the printing plate or blanket. The surface of an anilox roller is engraved with an array of closely spaced, shallow depressions referred as "cells". Ink or coating material from the reservoir 70 flows into the cells as the anilox roller turns through the reservoir. The transfer surface of the anilox roller is scraped with a doctor blade 73 to remove excess ink or coating. The ink or coating remaining on the anilox roller is the measured amounts contained within the cells.

The applicator roller 66 is cylindrical and may be constructed in various diameters and lengths, containing cells of various sizes and shapes. The volumetric capacity of an anilox roller is established during manufacturing and is dependent upon the selection of cell size, shape and number of cells per unit area. Depending upon the intended application, the cell pattern may be fine (many small cells per unit area) or coarse (fewer larger cells per unit area).

By applying the ink or coating material through the inking/coating applicator head 60, more ink or coating material can be delivered to the sheet S as compared with the inking roller train of a lithographic printing unit. Moreover, color intensity is stronger and more brilliant because the flexographic ink is applied at a much larger film thickness than can be applied by the lithographic process and is not diluted by dampening solution.

The inking/coating applicator head 60 includes side frame members 74, 76 that support the applicator roller 66, gear train 64, gear train 65, doctor blade assembly 68 and the drive motor 62. The applicator roller 66 is supported at opposite ends on a lower cradle formed by a pair of end plates 78, 80 which hold the applicator roller 66 in parallel alignment with the blanket cylinder 34 (FIGURE 5). The side frames 74, 76 are also provided with an upper cradle formed by a pair of side plates 82, 84 which are vertically spaced with respect to the lower side plates 78, 80. Each cradle has a pair of sockets 79, 81 and 83, 85, respectively, for holding the applicator roller 66 for spot coating or inking engagement against the plate P of the plate cylinder 32 (FIGURE 4) or the blanket B of the blanket cylinder 34.

Preferably, the applicator roller 66 for the upper cradle (plate) position is an anilox roller having a resilient transfer surface. In the dual cradle arrangement, the press operator can quickly change over from blanket inking/coating and plate inking/coating with minimum press down time, since it is only necessary to remove and reposition or replace the applicator roller 66, and wash-up the doctor blade assembly if changing from ink to coating or vice versa. The capability to selectively operate in either the flexographic mode or the lithographic mode and to print or coat from either the plate or blanket position is referred to herein as the "LITHOFLEX" process.

Referring again to FIGURE 2 and FIGURE 3, the applicator head 60 is supported by the carriage assembly 58 in a cantilevered, pivotal arrangement which allows the dual cradle inking/coating apparatus 10 and a single cradle inking/coating apparatus 110 to be used between any two adjacent printing units, as well as used on the first and last printing units of the press. This is made possible by a pair of cantilevered support arms 88, 90 that are pivotally coupled to the side plates 74, 76, respectively, on a pivot shaft 77. Each support arm has a hub portion 88A, 90A, respectively, and an elongated shank portion 88B, 90B, respectively.

The cantilevered support arms are pivotally mounted on the printing tower by pivot blocks 92, 94, respectively. The hub portions 88A, 90A are journalled for rotation on pivot shafts 96, 98, respectively. The pivot blocks 92, 94 are securely fastened to the tower 14D, so that the carriage assembly 58 is pivotally suspended from the pivot shafts 96, 98 in a cantilevered Ferris support arrangement. The shank portions 88B, 90B are pivotally coupled to the pivot shaft 77, so that the carriage assembly 58 and the applicator head 60 are capable of independent rotation with respect to each other and with respect to the pivot shaft 77. By this arrangement, the applicator head 60 is pivotally suspended from the pivot shaft 77, and remains in an upright orientation as the support arms rotate from the operative position to the fully retracted position, and vice versa.

Thus, the cradles 78, 80 and 82, 84 position the applicator roller 66 in vertical and horizontal alignment with the plate cylinder or blanket cylinder when the applicator head is extended to the operative position, for example as shown in FIGURE 4 and FIGURE 5. Moreover, because of the transverse relationship between the hub portion and shank portion of the support arms, the applicator head 60 and carriage assembly 58 are capable of rotating through a Ferris arc without touching the adjacent printing tower. This makes it possible to install the inking/coating apparatus 10 on any intermedi-

ate printing unit tower (T2, T3), and as well as on the first printing unit tower T1 and the last printing unit tower T4. Additionally, when the inking/coating unit 10 is in the operative position, the lateral projection of the applicator head 60 into the interstation space between printing units is minimized. This assures virtually unrestricted operator access to the interstation space between adjacent printing units when the applicator head is engaged in the operative position, and completely unrestricted access when the carriage assembly 58 is retracted.

Rotation of the carriage assembly 58 is counterclockwise from the retracted, idle position (shown in phantom in FIGURE 1) to the operative position (FIGURE 4 and FIGURE 5). The carriage assembly 58 can be adapted for clockwise rotation from the retracted position to the operative position for engagement of the applicator roller to either the plate or the blanket on the dampener side of the tower, assuming that access to the plate and blanket is not restricted by dampener rollers or the like.

Rotational movement of the support arms 88, 90 is assisted by counterweights 100, 102 which are secured to the support arms, respectively, for concurrent rotation with respect to the pivot blocks 92, 94. With the passive assistance of the counterweights, the press operator can easily move the inking/coating assembly 10 from the engaged operative position as shown in FIGURE 4 to the fully retracted, idle position as shown in phantom in FIGURE 1. Preferably, rotation of the carriage assembly 58 is assisted by a torsion spring, electric motor or hydraulic motor.

The inking/coating apparatus 10 is releasably locked into the operative position as shown in FIGURE 4 by releasable latch couplings 106, 106 that secure the support arms 88, 90 to the press side frames 14, 16, respectively, of the printing unit tower T4 in the operative position. Casting engagement of the applicator roller 66 against the blanket cylinder 34 is produced by power actuators, preferably pneumatic cylinders 104, 106 which have extendable/retractable power transfer arms 104A, 106A, respectively. The pneumatic cylinder 104 is pivotally coupled to the support arm 88 by a pivot linkage 108, and the second pneumatic cylinder 106 is pivotally coupled to the support arm 90 by a pivot linkage 109. In response to actuation of the pneumatic cylinders 104, 106, the power transfer arms are retracted. As the transfer arms retract, the inking/coating head 60 is rotated counterclockwise on the pivot shaft 77, thus moving the applicator roller 66 into casting engagement with the blanket cylinder 34.

The pivot linkage 108 includes a bell crank 111 which is mounted for pivotal movement on a pin 113. The pin 113 is supported by a clevis plate 115 which is attached to the support arm 88. One end of the bell crank is pivotally coupled to the actuator arm 104A, and a cam roller 117 is mounted for rotation on its opposite end.

The cam roller 117 is engagable against an adjustable stop 119 which is rigidly secured to the side plate 74. Counterclockwise shifting of the handle H moves a cam follower 121 into a latch pocket 123 of a receiver block 125 as the cam roller 117 is moved into engagement with the adjustable stop 119 in the interlocked, operative position. Referring to FIGURE 4, FIGURE 5 and FIGURE 6, the receiver block 125 is secured to the delivery side of the printing unit tower by machine screws.

When the plate P goes on impression, power is applied to the pneumatic actuator 104 and the power transfer arm 104A retracts, thus causing the bell crank 111 to rotate counterclockwise about the pin 113. The torque applied by the pneumatic actuator 104 is transmitted to the applicator head 60 through the cam roller 117 and the adjustable stop 119. Counterclockwise movement of the applicator head 60 relative to the support shaft 77 carries the applicator roller 66 into engagement with the plate P.

The adjustable stop 119 has a threaded bolt 119A which is engagable with the cam roller 117. The striking point of engagement is preset so that the applicator roller 66 is properly positioned for engagement with the plate P or blanket B in the operative position when the applicator head 60 is interlocked with the press frame 14 and the printing unit goes on impression.

Referring to FIGURE 5, an inking/coating apparatus 110 having a single head is illustrated. The construction of this alternative embodiment is identical in all respects with the dual head arrangement, with the exception that only a single gear train and a single cradle for holding the applicator roller is provided. In both embodiments, the inking/coating head 60 remains upright as it swings through an arc, comparable to the movement of a Ferris wheel. Because of the upright orientation of the inking/coating head 60 as it moves between the extended and retracted positions, the usual platform spacing between printing unit towers provides adequate clearance to permit extension and retraction of the carriage assembly 58 without interference with operator access to the printing units. This is a significant advantage in that it permits the in-line inking/coating apparatus 10 to operate effectively in the interstation space between any adjacent printing units, and without blocking or obstructing access to the cylinders of the printing units when the inking/coating apparatus is in the retracted position (as indicated in phantom in FIGURE 1).

Moreover, when the in-line inking/coating apparatus is in the fully retracted position, the applicator roller 66 is conveniently positioned on the dampener side of the printing unit for inspection, clean-up or replacement. Additionally, the doctor blade assembly is also conveniently positioned for inspection, removal, adjustment or clean-up. Also, the doctor blade reservoir and coating circulation lines can be cleaned while the press is running as well as when the press has been stopped for change-over from one type of ink or coating material to another.

When the inking/coating apparatus is used for applying an aqueous ink or an aqueous coating material, the water component on the freshly printed sheet S is evaporated by a high velocity, hot air interstation dryer and high volume heat and moisture extractor units 112 and 114, as shown in FIGURE 1, FIGURE 4 and FIGURE 5. The dryer/extractor units 112 and 114 are oriented to direct high velocity heated air onto the freshly printed/coated sheets as they are transferred by the interunit and the intermediate transfer cylinders 36, 40. By this arrangement, the freshly printed aqueous ink or coating material is completely dry before the sheet is overprinted in the next printing unit.

The high velocity, hot air dryer and high performance heat and moisture extractor units 112, 114 utilize high velocity air jets which scrub and break-up the moist air laval which clings to the surface of each freshly printed sheet. Within each dryer, high velocity air is heated to a high temperature as it flows across a resistance heating element within an air delivery baffle tube. High velocity jets of hot air are discharged through multiple airflow apertures through an exposure zone Z (FIGURE 4 and FIGURE 5) onto the freshly printed/coated sheet S as it is transferred by the transfer cylinder 36 and intermediate transfer cylinder 40, respectively. Each dryer assembly includes a pair of air delivery dryer heads which are arranged in spaced, side-by-side relation as shown in FIGURE 4 and FIGURE 5.

The high velocity, hot moisture-laden air displaced from each freshly printed sheet is extracted from the dryer exposure zone Z and completely extracted from the printing unit by the high volume extractors. Each extractor head includes a manifold coupled to the dryer heads and draws the moisture, volatiles and high velocity hot air through a longitudinal gap between the dryer heads. According to this arrangement, each printed sheet is dried before it is run through the next printing unit.

The water-based inks used in flexographic printing dry at a relatively moderate drying temperature, provided by the interstation high velocity hot air dryers/extractors 112, 114. Consequently, print quality is substantially improved since the aqueous ink is dried at each printing unit before it enters the next printing unit. Moreover, back-trapping on the blanket of the next printing unit is completely eliminated. This interstation drying arrangement makes it possible to print aqueous inks such as metallic inks and opaque white inks at one printing unit, and then overprint at the next printing unit.

This arrangement also permits the first printing unit to be used as a coater in which an aqueous coating is applied to low grade paper, for example recycled paper, to trap and seal in lint, dust, spray powder and other debris and provide a smoother, durable surface that can be overprinted in the next printing unit. The first down coating seals the surface of the low grade, rough substrate and improves overprinted dot definition while preventing strike-through and show-through. A UV-curable protective and/or decorative coating can be applied over the first down overprinted (aqueous) coating in the last printing unit.

Preferably, the applicator roller 66 is constructed of metal or ceramic when it is used for applying a coating material to the blanket B on the cylinder 34. When the applicator roller 66 is applied to the plate, it is preferably constructed as an anilox roller having a resilient transfer surface for engaging a flexographic printing plate. Suitable resilient roller surface materials include Buna N synthetic rubber and EPDM (terpolymer elastomer).

It will be appreciated that the inking/coating apparatus 10 is capable of applying a wide range of ink types, including fluorescent (Day Glo), pearlescent, metallics (gold, silver and other metallics), glitter, scratch and sniff (micro-encapsulated fragrance), scratch and reveal, luminous, pressure-sensitive adhesives and the like.

The press operator can eliminate the dampener roller assembly altogether, and the inking/coating apparatus 10 can selectively apply aqueous inks and coatings to a flexographic or waterless printing plate and the blanket. Moreover, overprinting of the aqueous inks and coatings can be carried out in the next printing unit since the aqueous inks and coatings are completely dried by the high velocity, hot air interstation dryer and high volume heat and moisture extractor assembly.

The aqueous inks and coatings as used in the present invention contain colored pigments and/or soluble dyes, binders that fix the pigments onto the surface of the printed sheet, and waxes, defoamers and thickeners. Aqueous printing inks predominantly contain water as a solvent, diluent and/or vehicle. The thickeners which are preferred include algonates, starch, cellulose and its derivatives, for example cellulose esters or cellulose ethers and the like. Coloring agents including organic as well as inorganic pigments may be derived from dyes which are insoluble in water. Also, the printing ink may contain water and can be predominantly glycol or the like, with the pigment being bound by an appropriate resin. When metallic inks are printed, the cells of the anilox roller must be appropriately sized to prevent the metal particles from getting stuck within the cells. The cell size is critical, and for metallic gold ink, the anilox roller should have a screen line count in the range of 175-300 lines per inch (69-118 lines per cm).

The inking/coating apparatus 10 can also apply UV-curable inks and coatings. If UV-curable inks and coatings are utilized, ultra-violet dryers/extractors are installed adjacent the high velocity hot air dryer/extractor units 112, 114, respectively.

It will be appreciated that the inking/coating apparatus 10 described herein makes it possible to selectively operate a printing unit in either the flexographic printing mode or the lithographic printing mode, while also providing the capability to print or coat from either the plate or blanket position. The dual cradle support arrangement of the present invention makes it possible to quickly change over from inking/coating at the blanket

cylinder position to inking/coating at the plate cylinder position with minimum press down-time, since it is only necessary to remove and reposition or replace the applicator roller 66 while the printing/inking apparatus is in the retracted position.

Moreover, the press operator may elect to spot or overall coat with aqueous ink/coating from the plate during one job, and then spot and/or overall coat from the blanket during the next job. Since the doctor blade assembly can be flushed and washed-up quickly and the applicator roller can be replaced quickly, it is possible to spot coat or overall coat from the plate position or the blanket position with aqueous inks or coatings during the first press run and then spot coat or overall coat with UV-curable inks or coatings from the plate position or from the blanket position during the next press run. The inking/coating apparatus 10 is completely out of the way in the retracted position; consequently, the doctor blade reservoir and supply lines can be flushed and washed-up by automatic wash-up equipment while the printing unit is printing another job.

The positioning of the applicator head and roller assembly relative to the plate and blanket is repeatable to a predetermined, preset impression position. Consequently, no printing unit adjustment or alteration is required, except for flushing the doctor blade assembly and cleaning or replacing the applicator roller to accommodate a different kind of ink or coating material. Although manual extension and retraction have been described in connection with the exemplary embodiment, extension to the operative position and retraction to a non-operative idle position can be carried out automatically by hydraulic or electric motor servomechanisms.

The Ferris wheel support arrangement allows the inking/coating apparatus to operate effectively in the interstation space between any adjacent printing units, as well as on the first or last printing units of the press, without blocking or obstructing the interstation space or restricting operator access to the cylinders of any of the printing units.

Finally, because the inking/coating apparatus of the present invention is mounted on a printing unit tower and is extendable to the operative position without requiring adjustment or alteration of the printing unit cylinders, it can be used for applying printing ink or coating material to the blanket cylinder of a rotary offset web press, or to the blanket of a dedicated coating unit.

Claims

1. Inking/coating apparatus (10) for use in a printing press (12) of the type having a printing unit (22, 24, 26, 28) on which a plate cylinder (32), a blanket cylinder (34) and an impression cylinder (36) are mounted for rotation, wherein the inking/coating apparatus is characterized by:

   an applicator head (60) for applying ink or coating material to a plate (P) mounted on the plate cylinder or to a blanket (B) mounted on the blanket cylinder, either separately or simultaneously when the inking/coating apparatus is in an operative position relative to the plate and blanket cylinders; and,

   a carriage assembly (58) for moving the applicator head to the operative position in which the applicator head is disposed laterally adjacent to the plate and blanket cylinders and for moving the applicator head from the operative position to a retracted position in which the applicator head is elevated with respect to the plate and blanket cylinders.

2. Inking/coating apparatus (10) as set forth in claim 1, wherein the carriage assembly (58) is characterized by:

   a support arm (88, 90) having a first end portion (88A) constructed for pivotal attachment to the printing unit and having a second end portion (88B) pivotally coupled to the applicator head (60), the applicator head being movable on the support arm to the operative position.

3. Inking/coating apparatus (10) as set forth in claim 1, characterized in that a counterweight (100, 102) is coupled to the carriage assembly.

4. Inking/coating apparatus (10) as set forth in claim 1, wherein the applicator head (60) is characterized by:

   a doctor blade assembly (68) having a reservoir (70) for receiving ink or liquid coating material; and,

   an applicator roller (66) coupled to the doctor blade assembly in fluid communication with the reservoir, the applicator roller being engagable with a printing plate (P) on the plate cylinder or with a blanket (B) on the blanket cylinder when the applicator head (60) is in the operative position.

5. Inking/coating apparatus (10) as set forth in claim 4, characterized in that the applicator roller (66) is an anilox roller having a resilient transfer surface.

6. Inking/coating apparatus (10) as set forth in claim 1, characterized in that:

   a power actuator (104, 106) is movably coupled to the applicator head (60), the power actuator having a power transfer arm (104A, 106A) which is extendable and retractable; and,

   movement converting apparatus (108) is coupled to the power transfer arm for converting

extension or retraction movement of the power transfer arm into pivotal movement of the applicator head (60) relative to the carriage assembly.

7. Inking/coating apparatus (10) as set forth in claim 6, wherein the movement converting apparatus (108) is characterized by:

a bell crank plate (111) having a first end portion coupled to the power transfer arm and having a second end portion for engaging a stop member;
a stop member (119) secured to the applicator head (60); and,
a clevis plate (115) secured to the carriage assembly (58) and pivotally coupled to the bell crank plate.

8. Inking/coating apparatus (10) as set forth in claim 1, wherein the applicator head (60) is characterized by:

first and second side frame members (74, 76) pivotally coupled to the carriage assembly (58);
a doctor blade assembly mounted on the first and second side frame members, the doctor blade assembly including a reservoir (70) for receiving ink or liquid coating material;
a cradle assembly (78, 80), (82, 84) mounted on the first and second side frame members, respectively;
an applicator roller (66) mounted for rotation on the cradle assembly and coupled to the doctor blade assembly for rolling contact with ink or coating material in the reservoir, the applicator roller being engageable with a printing plate (P) on the plate cylinder (32) or with a blanket (B) on the blanket cylinder (34) when the applicator head (60) is in the operative position; and,
a drive motor (62) coupled to the applicator roller for rotating the applicator roller.

9. Inking/coating apparatus (10) as set forth in claim 8, characterized in that:

the cradle assembly (78, 80) has first and second sockets (79, 81) disposed on the first and second side frame members respectively; and,
the applicator roller (66) is mounted for rotation on the first and second sockets.

10. Inking/coating apparatus (10) as set forth in claim 8, characterized in that

the cradle assembly (78, 80), (82, 84) includes first and second sockets (79, 81) disposed on the first and second side frame members, respectively; and third and fourth sockets disposed on the first and second side frame members, respectively; and,
the applicator roller (66) is selectively mountable for rotation on either the first and second sockets or on the third and fourth sockets for applying ink or coating material to either the plate or blanket when the applicator head is in the operative position.

11. Inking/coating apparatus (10) as set forth in claim 1, wherein the applicator head (60) is characterized by:

a first cradle (78, 80) for supporting an applicator roller (66) for engagement with the plate when the inking/coating apparatus is in the operative position; and
a second cradle (82, 84) for supporting an applicator roller (66) for engagement with the blanket (B) when the inking/coating apparatus is in the operative position.

12. Inking/coating apparatus (10) as set forth in claim 1, wherein the carriage assembly is characterized by:

a support arm (88, 90) having a first end portion pivotally coupled to the printing unit (88A, 90A) and having a second end portion (88B, 90B);
a common pivot shaft (77) on which the support arm second end portion and the inking/coating apparatus are pivotally mounted; and,
male and female latch members (103, 105) coupled between the common pivot shaft and the printing unit, with one of the latch members being secured to the common pivot shaft and the other latch member being constructed for attachment onto the printing unit, the latch members being mateable in interlocking engagement when the applicator head (60) is in the operative position.

13. Inking/coating apparatus (10) as set forth in claim 1, wherein the applicator head (60) and the printing unit are characterized by:

male and female latch coupling members (103, 105) mounted on the carriage assembly (58) and on the printing unit for releasably latching the carriage assembly in interlocking engagement with the printing unit when the applicator head is in the operative position.

14. Inking/coating apparatus (10) as set forth in claim 1, wherein the carriage assembly (58) is characterized by an elongated shank portion (88B, 90B) and a hub portion (88A, 90A), the elongated shank portion being pivotally coupled to the applicator head

(60) and the hub portion being constructed for pivotal attachment onto the printing unit.

15. A rotary offset printing press (12) having first and second printing units (22, 24) and the inking/coating apparatus (10) of claim 1 is movably coupled to the first printing unit (22) as set forth in claim 1, characterized by:

a dryer (112) mounted on the first printing unit adjacent the impression cylinder (36) of the first printing unit for discharging heated air onto a freshly printed substrate while the freshly printed substrate is in contact with said impression cylinder.

16. A rotary offset printing press (12) as defined in claim 15, characterized in that:

an extractor (112E) is disposed adjacent the dryer for extracting hot air, moisture and volatiles from an exposure zone (Z) between the dryer and the freshly printed substrate.

17. A rotary offset printing press (12) as defined in claim 15, characterized in that:

an intermediate transfer cylinder (40) is coupled in sheet transfer relation with the impression cylinder (36) of the first printing unit (22); and,
an intermediate dryer (114) is disposed adjacent the intermediate transfer cylinder for discharging heated air onto a freshly printed or coated substrate after it has been transferred from the impression cylinder of the first printing unit and while it is in contact with the intermediate transfer cylinder (40).

18. A method for rotary offset printing in a printing press (12) of the type including first and second rotary offset printing units (22, 24), and using aqueous or UV-curable printing ink or coating material in the operation of at least the first printing unit, characterized by the following steps performed at each printing unit in succession:

spot or overall coating a plate (P) with aqueous ink/aqueous coating material or UV-curable ink/UV-curable coating material;
spot and/or overall coating a blanket (B) with aqueous ink/aqueous coating material or UV-curable ink or UV-curable coating material;
transferring the printing ink or coating material from the printing plate (P) to the blanket (B);
transferring the inked or coated image from the blanket to a substrate (S) as the substrate is transferred through the nip between the impression cylinder (36) and the blanket (B); and,
drying the ink or coating material on the freshly printed substrate before the substrate is subsequently processed.

19. A method for rotary offset printing as defined in claim 18, wherein the drying step is characterized by:

discharging high velocity, heated air onto the freshly printed/coated substrate (S) while the freshly printed/coated substrate is in contact with the impression cylinder (36) of the first printing unit (22).

20. A method for rotary offset printing as defined in claim 18, characterized by the steps:

transferring the freshly printed substrate (S) from the first printing unit (22) to an intermediate transfer cylinder (40); and,
drying the freshly printed substrate while it is in contact with the intermediate transfer cylinder.

21. A method for rotary offset printing as defined in claim 18, characterized by the step:

extracting hot air, moisture and volatiles from an exposure zone (Z) above the freshly printed/coated substrate (S) while the freshly printed/coated substrate is in contact with the impression cylinder (36).

22. A method for rotary offset printing as defined in claim 18, characterized by the steps:

applying a primer coating of an aqueous coating material or UV-curable coating material to a substrate (S) in the first printing unit (22); and,
drying the primer coating on the substrate before the substrate is processed in the second printing unit.

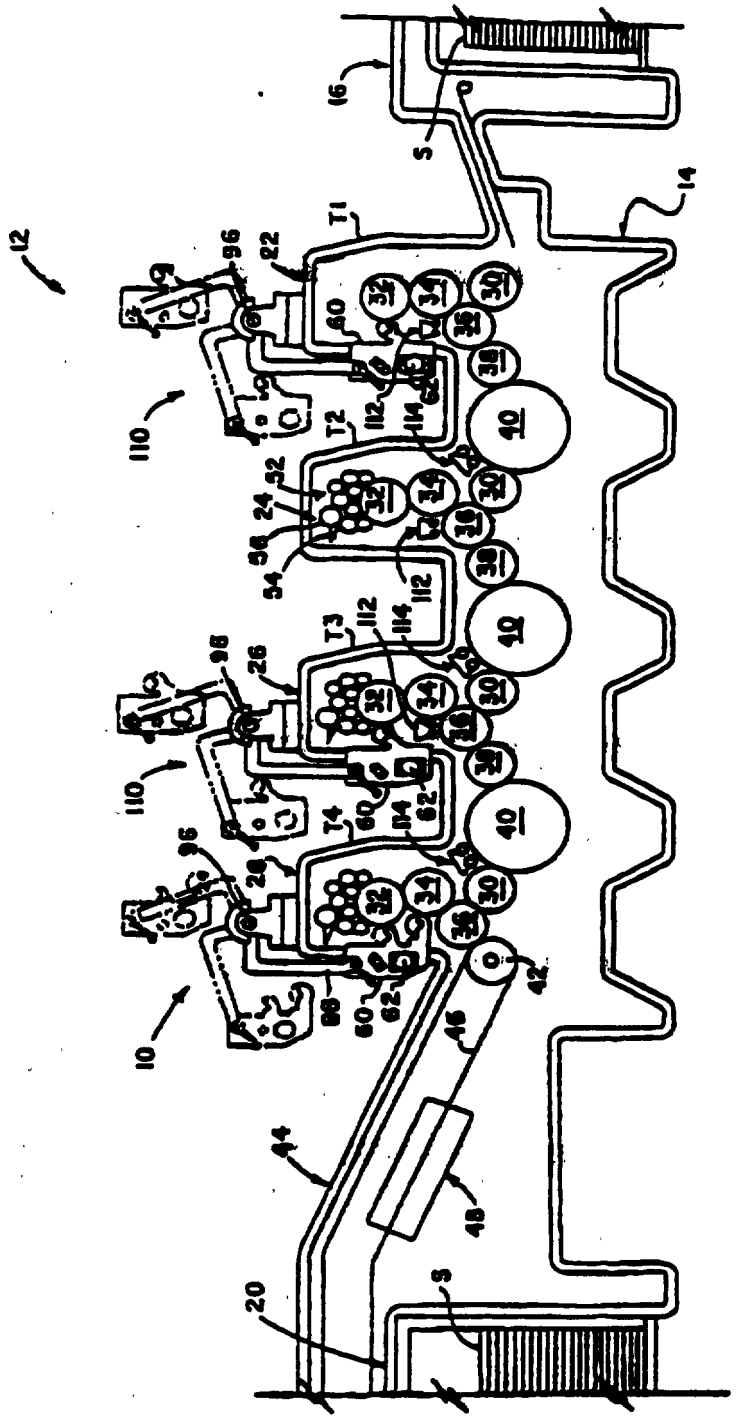

FIG. 1

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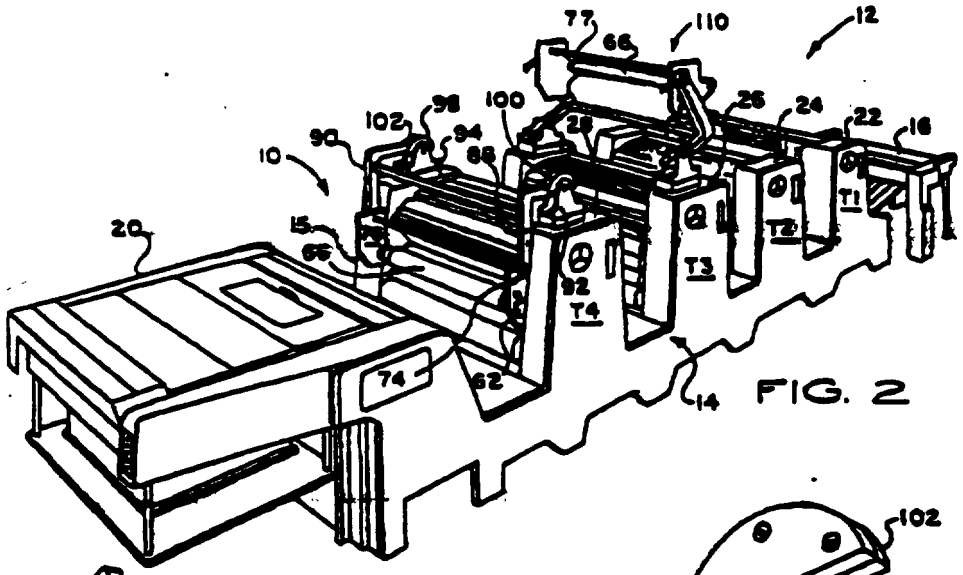


FIG. 2

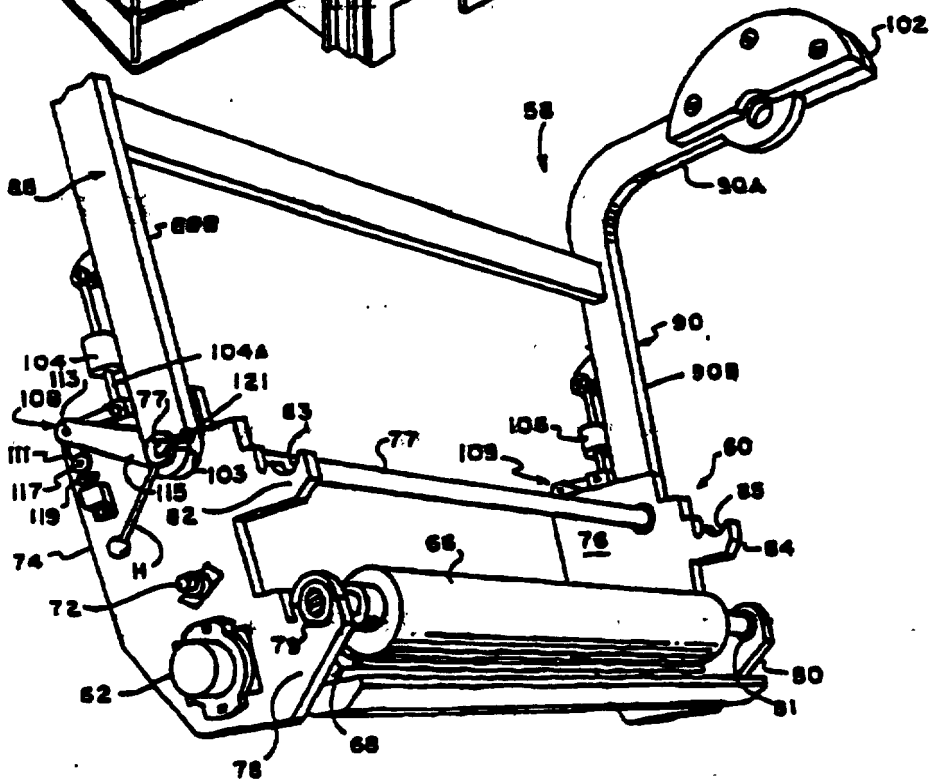


FIG. 3

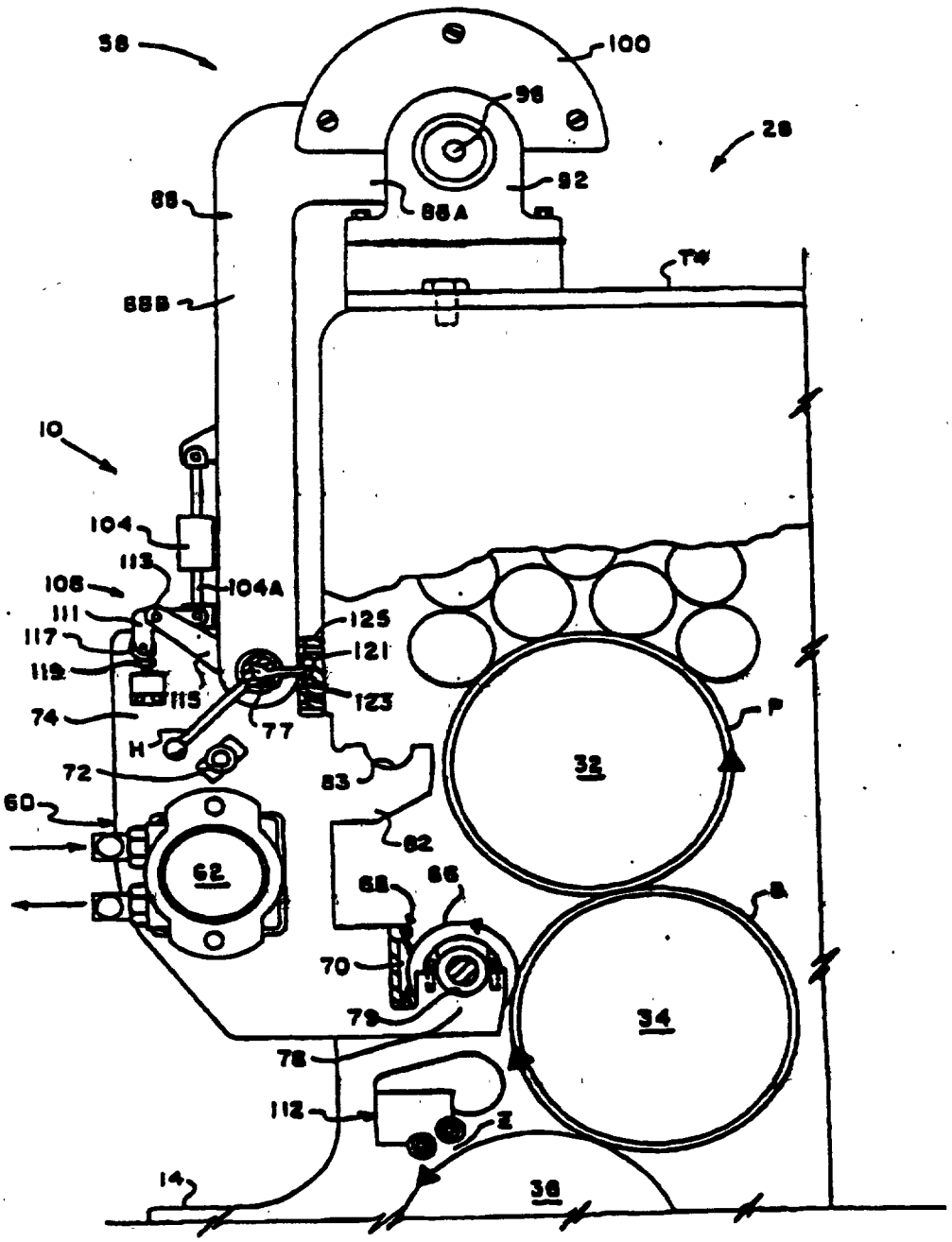


FIG. 4

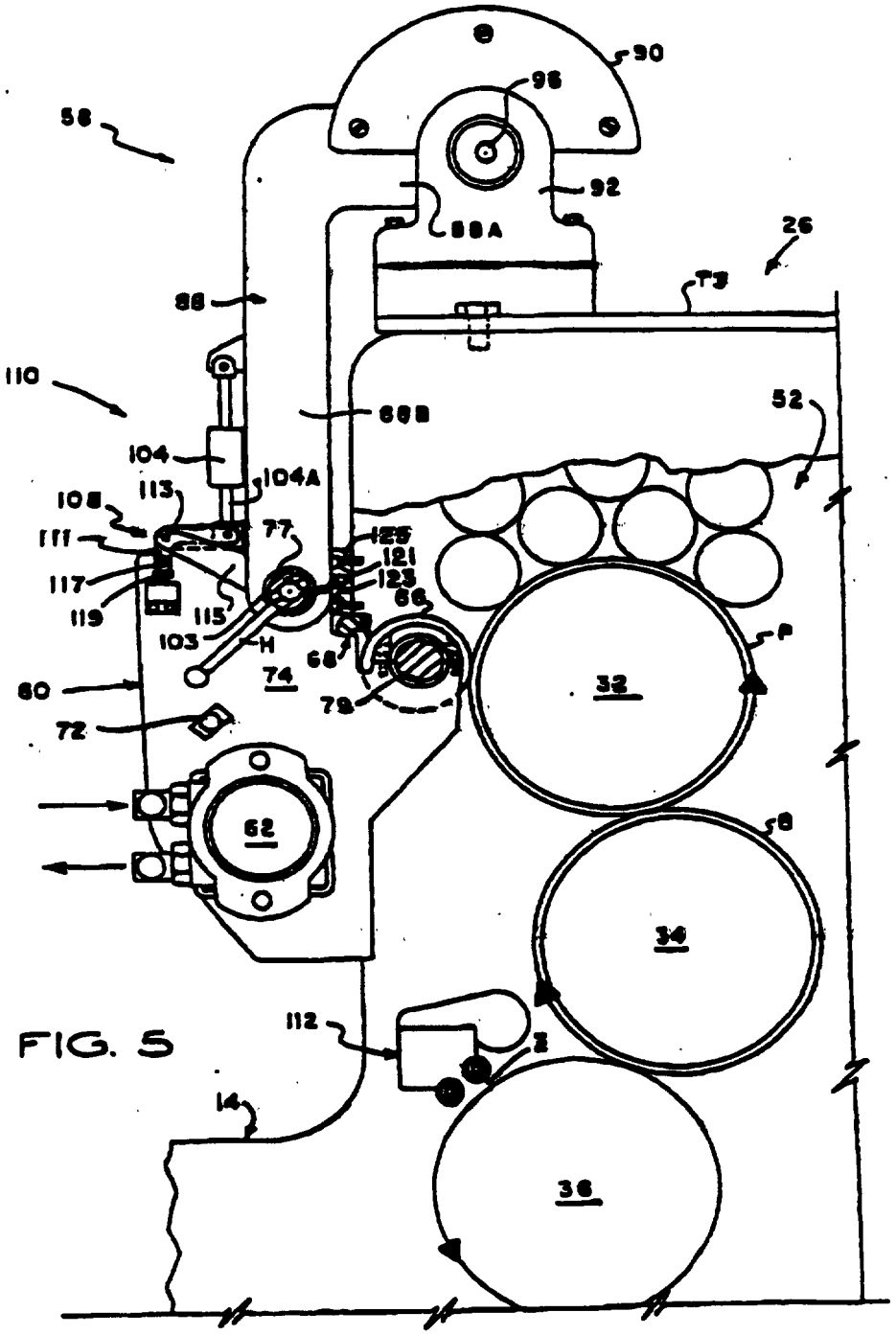
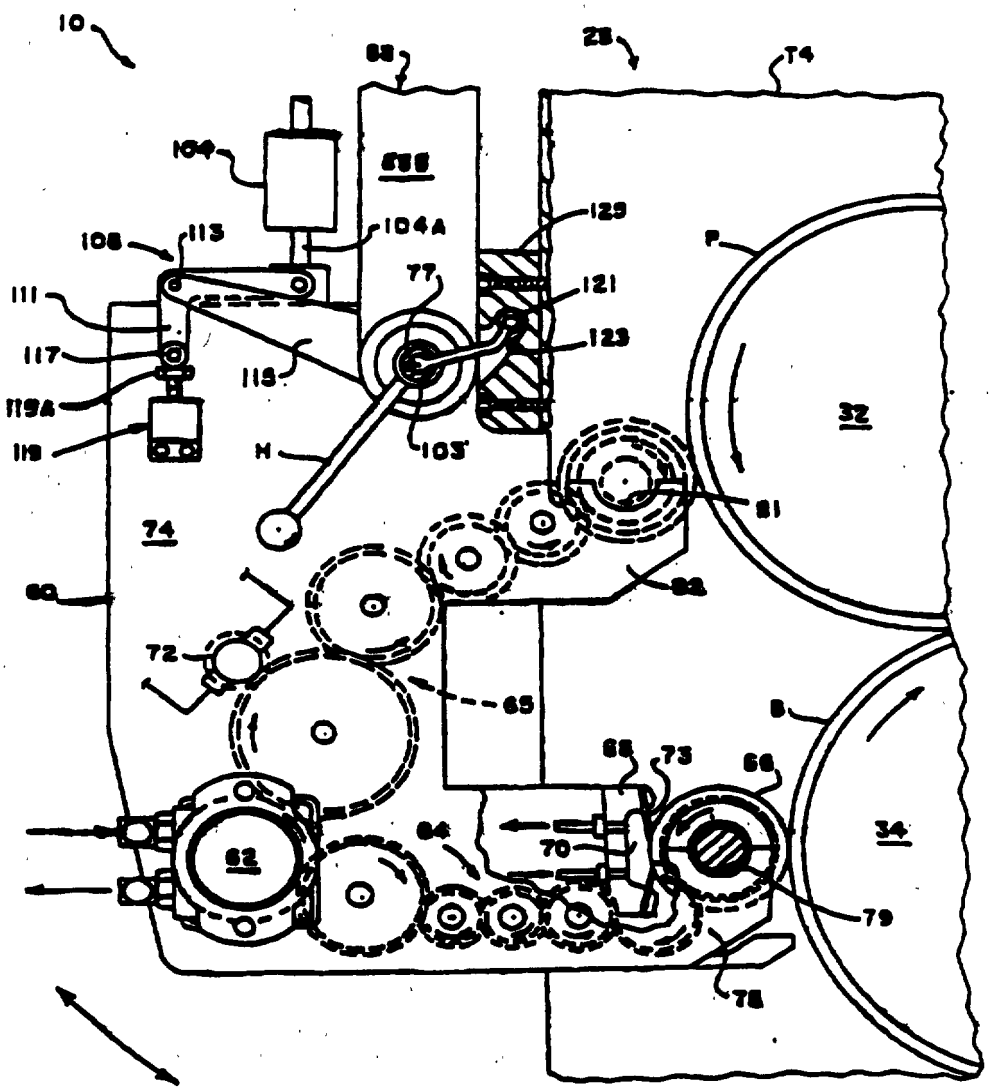


FIG. 5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88
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T4
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129
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111
123
117
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119A
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119
H
105
81
74
80
82
72
65
B
68
73
66
34
64
70
62
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FIG. 6

PATENT
Our File: WILL 2501

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Reissue Application of: BILL L. DAVIS and JESSE S. WILLIAMSON	§	
For Reissue of U. S. Patent 5,630,363 Issued May 20, 1997 Serial No. 08/515,097	§	Group Art Unit: 2854
Filing Date: May 20, 1999	§	Examiner: _____
Serial No.: 09/315,796	§	
For: COMBINED LITHOGRAPHIC/ FLEXOGRAPHIC PRINTING APPARATUS AND PROCESS	§	

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FEB 23 2001
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DECLARATION OF STEVEN BAKER

TO: The Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

SIR:

I, Steven Baker, declare on my oath the following:

1. I am over twenty-one (21) years of age, have never been convicted of a felony, and am competent to make this testimony. I reside at ~~209~~ 207 (55) Craig Drive, Heath, Texas 75032. I am currently employed as a salesman by Epic Products International Corporation, located at 2801 E. Randol Mill Road, Arlington, Texas 76011.

2. From about August of 1991 through July 1997 I was employed as a salesman at Printing Research Corporation of Dallas, Texas. I was told on January 2, 1997 that I was a "contractor" rather than an employee, but at that time I continued receiving business cards identifying me as a salesman of Printing Research Corporation, worked forty hours a week for Printing Research, and had ~~an~~ no (55) office at Printing Research. I paid my own taxes during this period. The Internal Revenue Service ruled that I was, in fact, an employee in this period after

January 2, 1997, and I was given credit for the social security taxes I paid, and in due course I received from Printing Research a 401K contribution for 1997.

3. I graduated from East Texas State University in 1975 with a B.S. in Journalism – Printing Management and have had a career in printing and sales in the printing and food industries up until I went to work for Printing Research in August 1991.

4. Sometime in late July 1994 I met with Bill Davis and Jesse Williamson on a Sunday in Atlanta, Georgia. I remember some intense business discussions which occurred at a Morton's Steakhouse in Atlanta. The discussions are very memorable to me, in part because it was late on Sunday and we were lost in Atlanta and it took a long time to find a good place to eat which was open.

5. I was aware as of the time of this meeting that the employer of Jesse Williamson and Bill Davis, Williamson Printing Corporation, had settled a lawsuit with my employer, Printing Research Corporation, and that part of the settlement involved an obligation on the part of Williamson Printing Corporation to buy a set amount of equipment and/or supplies from Printing Research. The atmosphere was friendly at the restaurant, and in fact it was my understanding that Williamson Printing had already committed to purchasing dryer equipment from Printing Research for a line of Heidelberger printing presses to be installed at Williamson starting in late 1994 running well into 1995. In fact, as part of the Atlanta trip, I showed Jesse Williamson a Printing Research-constructed HV interstation drier at a local carton printer manufacturer in the Atlanta area. I was informed of Williamson Printing Corporation's proprietary "WIMS" process concerning the printing of metallic inks, and was informed by Jesse Williamson and Bill Davis that a patent application was pending concerning the "WIMS" process. I recall being shown some Rolex watch advertisements that were part of some jewelry catalogues that were printed by what Jesse Williamson and Bill Davis described as the WIMS process, and that I was impressed with the brilliance of the gold and silver in the advertisements. Jesse Williamson even picked up the bill for dinner, which was unusual, because I was the salesman trying to sell Williamson equipment.

6. It was clear to me that the discussions took place in confidence and that Jesse Williamson and Bill Davis intended that I not publicize outside those with a need to know what was being discussed at the restaurant meeting in Atlanta.

7. Jesse Williamson and Bill Davis spoke that they had an invention to improve the WIMS process to make the metallic inks printed appear even more brilliant. They confided in me that they wanted to use flexography at a station they designated "upstream" – perhaps even the first station – of one or more offset lithographic presses that they would receive from Heidelberger. They mentioned several ways in which this could be done – by a dedicated flexographic station which would replace an existing lithographic station, by a bolt-on manually added device that would be used on a run-by-run basis, or most preferably, a retractable or "rack-back" mechanism which would have to be modified for "upstream" use. They mentioned that with respect to the rack-back option, that they would have to have with the retractable mechanism an anilox roller, a chambered doctor, and the use of state-of-the-art flexographic plates. They mentioned they had just seen the use of some of these flexographic plates in Germany, and that a number of companies sold high-resolution plates which would work in their new process. They asked me whether or not Printing Research was interested in supplying these types of rack-back or retractable devices, and I told them that Printing Research had available for modification such a rack-back which was not dissimilar to Dahlgren International's device currently sold, or other devices which were sold by our competitors. Our rack-back was developed, I recall, by a fellow Printing Research employee, John Bird, when John Bird was employed previously at another company in the eastern part of the United States. I believe that these machines were being supplied to us by a company called Effritz Tool Company.

8. Jesse Williamson and Bill Davis indicated to me that they wanted to run some tests at Printing Research using the retractable equipment which might be modified for interstation use. These tests – conducted for Williamson Printing Corporation – occurred later in 1994, I recall in October, possibly as late as November. I recall Williamson supplying the flexographic inks and the flexographic plates for these tests, conducted at their direction.

9. Afer the July 1994 Atlanta meeting – a meeting in which Williamson had not yet committed to purchase the rack-back devices from Printing Research, but was interested in Printing Research's potential modification of its rack-back to fit the new and improved process of Jesse Williamson and Bill Davis, and upon my return to Dallas, I conveyed to John Bird and Steve Garner of Printing Research the confidences I had learned in Atlanta of the new process. In the months that followed, in an effort to get the business, Printing Research did start working and did develop a coater for Williamson Printing that was called "the Rendleman coater" by those of us at Printing Research, including Bird, Garner and me. The unit was modified to be cantilevered rather than linear. The mechanical engineering was done by Rendleman, who I recall was not an "idea man," but just did the mechanical design work which was requested by his superiors. In addition to John Bird and Steve Garner, I informed Howard DeMoore of the trip, although I cannot recall if I told him of all the technical details I told John Bird and Steve Garner. There were actually two cantilevered devices built for Williamson Printing Corporation – a short-arm end-of-process device first installed on the coating tower of a new 7 color Heidelberg CD – the installation I recall in late February or thereabouts – and a series of long-arm devices built for interstation use, the first deployed later in 1995.

10. I recall a meeting that took place at Williamson in January 1995 prior to the installation of the first, or short-arm device. The meeting took place, as I recall, in Conference Room E at Williamson Printing Corporation, attended by Jesse Williamson, Bill Davis, John Bird and myself. At this meeting, Jesse Williamson told John Bird and myself that he (Williamson) and Davis were going to file a patent application on the new process. I recall that going back to the offices of Printing Research, Bird was amazed that anyone could obtain patent protection on a process apart from the "iron," i.e., a device used in carrying out that process. He called it a brilliant move, but did not know whether such patenting could take place.

11. Recently, I spoke with Howard DeMoore at an industry conference in Chicago (the Graph Expo '99 Conference). Howard claimed he was amazed that Williamson – he alleged

– was claiming the "Rendleman coater" My belief is that Bird and DeMoore are confused as to the difference between claiming a process and a device to carry out that process.

12. There is no doubt in my mind that based upon (1) my discussions with Jesse Williamson and Bill Davis in Atlanta in July 1994, (2) their prior development of the WIMS process as described to me in 1994, (3) the information I conveyed to at least John Bird and Steve Garner of Printing Research upon my return from Atlanta in July 1994, and (4) my personal knowledge of the skills and work history of Rendleman, Bird and DeMoore, that none of Rendleman, Bird and DeMoore had any part in the invention of the process of the captioned '363 patent which was disclosed to me in July 1994 in Atlanta. Rendleman was essentially a skilled mechanic to build what others wanted. DeMoore was a pressman by trade. Bird admitted to me he did not invent the process, and I knew that anyway.

The undersigned Declarant stated further that all statements made herein of Declarant's own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such statements may jeopardize the validity of the application of any reissue patent issuing thereon.

Steven Baker

November 3, 1999
Date:

PATENT
Our File: WILL 2501

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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For Reissue of U. S. Patent 5,630,363 Issued May 20, 1997 Serial No. 08/515,097	§	Group Art Unit: 2854
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SUPPLEMENTAL DECLARATION OF STEVEN BAKER

TO: The Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

SIR:

I, Steven Baker, declare under the penalties of perjury the following:

1. I am the same Steven Baker who executed a declaration in the above-captioned proceeding on November 3, 1999. I reaffirm the statements made therein, as clarified in my August 9, 2000 deposition, and with the following clarifications:

2. I have been shown travel receipts of Jesse Williamson, having production numbers W002705-2706, Exhibit "A" hereto. I note on document W002705 a reference to "Morton's Buckhead" restaurant for June 12, 1994. A calendar for June 1994, Exhibit "B" hereto, shows June 12th to be Sunday. I therefore met with Jesse Williamson and Bill Davis in Atlanta, Georgia on Sunday, June 12, 1994. As indicated in paragraph 4 of my prior declaration, the meeting was indeed on a Sunday. The rest of the Atlanta events I testified to in paragraphs 4-7 and the first sentence of paragraph 8 are accurate.

3. The calendar and the receipt further refresh my recollection. I came back to Dallas several days later – either Tuesday the 14th or Wednesday the 15th, as I recall. The morning following my return, I met with John Bird in Bird's office. Jesse and Bill's desires presented quite an opportunity for PRI. I have a vivid recollection of this meeting, and I told

Bird what Jesse and Bill had told me in the Morton's restaurant, as stated in paragraphs 5-7 and the first sentence of paragraph 8 of my prior declaration.

4. I also recall telling Howard DeMoore, immediately after telling Bird, that Jesse and Bill desired to go "up front" with a modified "rack-back" having an anilox roller and chambered doctor. The trip to Atlanta was a high profile event inside PRI, and telling Bird and DeMoore of what went on there occurred immediately upon my return. DeMoore needed to know – he ran the company. I believe I also told Steve Garner.

The undersigned Declarant stated further that all statements made herein of Declarant's own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such statements may jeopardize the validity of the application of any reissue patent issuing thereon.

Steven Baker

October 5, 2000
Date: